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SHEEP IN CANADA

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FRONT COVER

Sheep in Canada

Herd of sheep in the hills of the Kamloops, British Columbia district of Canada. In many countries of the world today, grasslands are the largest undeveloped resource of food. (Photo by Canadian National Film Board.)

BACK COVER

Republic of Colombia

The Republic of Colombia, founded in 1810, inherited a great many problems of land tenure that grew out of the casual attitudes toward land titles that were held in the colonial period.

NEWS NOTES

Point Four Specialists Reinking and Mabee Receive Superior Service Awards

Otto A. Reinking and William B. Mabee, United States Department of Agriculture Point Four specialists, have received Superior Service Awards from Secretary of Agriculture Charles F. Brannan in recog-

nition of their technical assistance work in the Philippine Republic and Iran, respectively. Both are representatives of the Office of Foreign Agricultural Relations.

Dr. Reinking received the Superior Service Award "for leadership and skill in developing a practical solution to the control of mosaic disease of Manila hemp in the Philippines, thereby contributing greatly to the economic stability of Philippine agriculture." Mr. Mabee won the same honor "for establishing new procedures in locust control in the Near East and southern Asia, thereby greatly contributing to the agriculture of that area and promoting international cooperation and goodwill among nations."

Haggerty New OFAR Director

John J. Haggerty, U.S. Agricultural Attaché in Yugoslavia for the past 3½ years, has been appointed Director of the Office of Foreign Agricultural Relations by Secretary of Agriculture Charles F. Brannan. Mr. Haggerty succeeds Stanley Andrews, who is now Technical Cooperation Administrator of the Department of State. Following the appointment, Secretary Brannan, on May 12, personally installed Mr. Haggerty in his new position in a simple ceremony in which Under Secretary Clarence J. McCormick and Assistant Secretary Knox T. Hutchinson also participated.

Francis A. Flood, who assumed the Directorship on a temporary basis last January 18 has been named Assistant Director, replacing Eric Englund, who is now U. S. Agricultural Attaché in London.

NOTE: The July and August issues of FOREIGN AGRICULTURE will appear together this year as a Summer Issue and will be published late in July.

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ALICE FRAY NELSON, EDITOR



Need for Improving The World's Grasslands

Special attention is centered on the world's grassland resources at this time as a result of the Sixth International Grassland Congress scheduled to meet in the United States this fall.

by W. M. MYERS



Grassland improvement affords a unique opportunity for raising the dietary level of people throughout much of the world. In the United States today, grasslands provide the largest undeveloped resource of food. And to a large degree, this statement is equally true of other countries.

This is to most people a strange concept. Generally speaking, grasslands have been the orphan children among agricultural crops. Emphasis in food production has been placed on the cereal grains, both for human consumption and for livestock feed. In cash crop production, such high-value crops as cotton, tobacco, cacao, and coffee have received primary attention. And the grasslands have been neglected. There is a widespread belief that grasslands are not productive—that the spigot of agricultural abundance is turned off by planting agricultural land to grass and is turned on by

plowing the grasslands and producing the so-called cultivated crops. But this is a false concept. Grassland improvement throughout the world offers an opportunity that must not be neglected if dietary levels are to be raised, or, in fact, even maintained in the face of an ever-increasing population pressure. There are several reasons why this is true—why we cannot continue to neglect our grasslands.

More Livestock Products Are Required

Major segments of the world's population are hungry today. Throughout most of the world, diets are substandard, especially in vital protein and minerals. For hundreds of millions of people, meat and milk are rare items. Many never eat meat or drink milk during their lifetime. These hundreds of millions never get enough protein and minerals;

Dr. Myers is Director of Field Crops Research, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration.

they must depend on food crops, chiefly cereals, for nearly all their nutrients.

Even in the United States we are not now producing enough meat and milk for adequate nutritional levels. And certainly we are not producing as much meat as our people want. In 1951 we ate 14 pounds more meat per capita than in 1935-39. Most of this increase was in pork and poultry. Consumption of beef—the most popular item in the American diet remained essentially the same. And the reason is that there was no more beef to buy.

During the past decade the population of the United States increased by about 20 million. It is now going up at the rate of 7,000 a day. If we Americans are to be as well fed in another quarter of a century as we are today, we will, with the present rate of population increase, require 25 percent more food than we are now producing. And we must increase our production even more than that if the needs and desires of our people for more meat are to be satisfied.

In a few other countries—Argentina and Australia, for example—the level of meat consumption exceeds that of the United States. Even in these countries, however, the pressure of the population is making it difficult to maintain consumption and exports. In most countries, population pressure measured against agricultural production is such that the situation is much worse—the people must consume crops directly, particularly cereals. It is a well-known fact that more calories can be produced on an acre of arable land through food crops for direct consumption than through feed crops that are converted to meat and milk by livestock. Thus, if population pressures continue to increase, people all over the world may eventually be forced to accept the diet of the Asiatics, undesirable as that may be from the dietary standpoint. But with adequate attention directed to improving the world's grasslands, that time need not come soon.

Meat and Milk from Forage Crops

Meat and milk can be produced on high quality forage alone. Feed grains and other concentrates are not essential for production of beef, mutton, and dairy products, despite a widespread belief to the contrary. In the United States, even with existing economic conditions, the grasslands provide, as pasture, range, hay, and grass silage, the major raw materials for the production of livestock products. Actually, in 1941-46, hay and pasture provided more

than 51 percent of the nutrients consumed by all classes of livestock in the United States. And some classes obtained greater proportions of their nutrients from forage—two-thirds for dairy cows, three-fourths for beef cattle, and nine-tenths for sheep.

For most economical production of beef, mutton, milk, and wool, even higher proportions of the nutrients should be obtained from forage. American farmers are being wasteful of feed grains and other concentrates with present feeding programs.

In Tennessee, dairy cows have been carried through successive lactations on forage alone and have produced 8,000 pounds of milk annually. In New Jersey, over a 5-year period, dairy cows that were fed high-quality pasture, hay, and grass silage, but no concentrates, produced an average of 8,400 pounds of milk per year. At the United States Department of Agriculture's Research Center, a cow has averaged more than 9,000 pounds of milk for nine lactations and has never been fed concentrates.

The average annual production of milk by dairy cows in the United States is 5,300 pounds per cow. With adequate supplies of nutritious pasture, hay, and grass silage, we could produce as much milk in this country without any concentrates as we are now producing with present feeding schedules. Or we could greatly increase milk production, without increasing the consumption of feed grains, by adopting more commonly a 1 to 6 ratio of concentrate feeding instead of the now common 1 to 3 ratio. And it should be remembered that we are now feeding to our dairy cows between 25 million and 30 million tons of concentrates annually.

In some other countries much progress has been made toward maximum use of quality forage in milk production. This is especially true in New Zealand, the Netherlands, and Denmark.

Contrary to popular opinion that corn is essential in beef production, beef cattle in the southeast and in other sections of the United States are being finished to good and choice market grades on grass—without any concentrates. At the North Mississippi Experiment Station, for example, steers that were fattened on Italian ryegrass winter pasture alone gained 2.30 pounds per day, a total of 326 pounds per acre, with a net profit per steer of \$84. Comparable steers in the same experiment fed grain in dry lot gained 2.46 pounds per day but made a net profit of only \$48 per steer. Beef, then, can be produced from grass at less cost than from grain—by producing beef from grass we can make it avail-

able to more of the world's population. Again, as with milk production, we can produce much more beef with adequate quantities of high quality forage than we are now producing, without further pressure on scarce feed grain supplies.

Some other countries are well ahead of the United States in producing beef from grass. The fattening pastures of the East Midlands of England are famed among grasslands workers. There for generations beef has been fattened on grass.

Potentials of Increased Production from Grasslands

The enormous potentialities that grasslands provide for increased production of feed for livestock and hence of meat, milk, and other livestock products exist for three reasons: (1) the world has the vast areas of grassland, (2) they are generally unimproved, and (3) the productive capacities of improved grasslands have been proved.

In the United States over a billion acres—more than half the total area of the country—is in grazing land. Much of this land is in the subhumid plains, the arid deserts, and the forests. But in the eastern half of the country, where rainfall and other climatic conditions encourage luxuriant growth of grasses and legumes, there are approximately 230 million acres of open—nonforested—grasslands. Most of this land is unimproved. Almost-bare eroded hillsides, scattered brush, weeds, and the

ever-present broom sedge and poverty grass are mute evidence of the years of neglect of these grasslands. In the United States, research on grassland crops and problems has lagged many years behind research on the cereals, cotton, tobacco, and other farm crops. And this neglect of research has been merely a reflection of the general public opinion of the value of grasslands. Even today, with the rapidly awakening consciousness of the importance of grassland improvement in the United States, research and practice in this major agricultural field still trail the other farm crops.

In other countries of the world, grasslands likewise occupy vast areas. About one-fifth of the land area of the world is or was in natural grasslands. Large areas, too, are in desert shrub, useful for grazing, and some of the forests have been replaced with grasslands. Even in such a densely populated and intensely agricultural country as Japan, there are several millions of acres, unsuited for intensive cropping, that could be developed into productive grasslands. Generally, throughout the world, grasslands are even less improved than in the United States. Only in a few countries—some of the nations of Western Europe, New Zealand, Australia, and a few others—has a grassland agriculture really developed.

Improvement practices—fertilization, seeding of improved varieties of adapted species, grazing management to provide optimum production and



Spreading phosphates on a dairy pasture at Tongalla, Victoria, Australia.

utilization—have commonly, in experiments and farmer experience, resulted in doubling and trebling production of the unimproved grasslands. In fact increases of fourfold to sixfold have not been uncommon. In Pennsylvania, for example, where unimproved pasture was capable of producing about 1,000 pounds of dry matter per acre, application of lime and fertilizer resulted in yields of 3,000 pounds per acre after about 3 years. Renovation with tillage, liming, fertilizing, and reseeding to productive grasses and legumes resulted in 6,000 pounds per acre, six times the production of the unimproved pasture. In the Southern States, beef yields of 600 to 1,000 pounds per acre on improved pasture are becoming almost commonplace. Some farmers are even talking of 2,000 pounds of beef per acre per year.

It has been mentioned that there are 230 million acres of open grasslands in the eastern half of the United States. In addition, there are about 70 million acres of abandoned crop and brush land on farms of the Southeastern States on soil types suitable for pasture development. If all of these 300 million acres were converted to improved pastures—and this is possible with the knowledge and plant materials we have—and if that increased pasture production were used for beef cattle, this eastern half of the United States could produce annually 10 million to 15 million tons of beef more than it is now producing. And the present total beef production in the United States is about 5 million tons. This enormous production will probably not be attained in the foreseeable future but at least it provides a measure of the challenge and hope that can be placed in our grasslands. Applying such estimates to the vast grassland resources of the world leaves little doubt of the capacity to provide meat and milk for much of the population of the world if adequate attention is given to research and practice of grassland improvement.

Grasslands Are Productive

On much of the cropland of the United States, grasslands will produce more total digestible nutrients, at less cost, and with greater returns per man-hour of labor than will corn or the other feed grains. Not only will grassland crops hold their own in feed production on productive cropland but they will also produce well on much land that is unsuited by topography, drainage, or other physical factors to crops that require tillage. In any agricultural economy that has livestock production as an essential

feature, grassland must provide the basis of the cropping system if maximum feed production is to be attained.

Grasslands, Essential for Sustained Production

It has been shown repeatedly, in the United States, that improved grasslands are required in the crop rotation for sustained maximum production of other crops in that rotation. No other cropping system suitable for American agriculture has yet been devised that will maintain the organic matter of the soil. Without grassland crops in the rotation, our farmers cannot "have their cake and eat it too." But with a cropping system based on production and use of improved grasslands they can "eat their cake and have even more of it to eat later."

The question may well be raised, however, regarding the feasibility of using rotations involving grasslands in areas where the entire crop production is required for direct consumption by the people. Introducing grassland crops into the rotation will increase per acre yields of grain crops in the rotation. But in areas such as Japan and China where every effort is made to maintain fertility and to return to the soil all available organic matter, the increased per acre yield will not compensate for loss of grain production from that land while in the grassland crops. In such areas, grasslands seem to have little place on the cropland. Yet it should be remembered that the Dutch have developed an intensive grassland agriculture in one of the most densely populated countries of Europe.

Research, the Keynote of Success

Grassland improvement is a challenge and an opportunity. It is also a necessity if the people of the world are to have more and better food. But grassland improvement is not possible today in many areas of the world because information and plant materials are lacking. They must be provided by research. There is a widespread belief that we now know all of the answers, that we now need only to disseminate the information to the farmers. But in many countries of the world there has been no grassland research. In many other countries the research work has been hopelessly inadequate. Grassland development programs in those countries must be approached with caution, for without research information and the necessary plant materials, the programs will fail. Research is the keystone of success in grasslands improvement as in any agricultural program.

Torsalo in Nicaragua

by KEITH HIMEBAUGH



Influential cattlemen in Nicaragua will tell you without hesitation that they are now able to operate profitably again because of the work of United States Department of Agriculture technicians, teaming up with Nicaraguans under the Point Four program.

When I talked to Daniel Salazar near Managua, he told me that in 1950 he was seriously considering going out of the cattle business because of losses caused by torsalo, which is a serious parasitic affliction of cattle in Nicaragua. Now that United States technicians have demonstrated how to control torsalo, he has bought a new ranch of about 3,400 acres and is going into cattle production in a big way.

Fred Bush, who owns a ranch at Matagalpa, about 90 miles north of Managua, told me that he formerly lost from 30 to 40 percent of his calves because of torsalo. Now, by the use of control methods worked out by the United States technicians, he has cut calf losses to about 10 percent.

It would be hard to visualize the effects of a scourge like torsalo in the cattle industry in the United States, but Señor Salazar gave me an idea of what might happen to ranchers, cattle feeders, and dairymen, and to the housewives who buy meat and milk, if this pest were suddenly to descend upon the United States. Based on his experience and years of observation, Señor Salazar expressed the belief that, in the epidemic stage, torsalo may reduce meat and milk production as much as 25 percent and may result in the loss of as much as one-half of the calf crop. It is no wonder that so many people in Nicaragua value the technical assistance of just this one phase of the Point Four program.

Torsalo has been causing trouble in Nicaragua for 25 years or more. During the past 10 years it has reached serious proportions and now has spread to perhaps as much as three-fourths of the country. And, because much of Nicaragua still is frontier cattle country, the effect of torsalo on agriculture is somewhat similar to the situation that would prevail if the parasite were turned loose in the Great Plains cattle area of the United States.

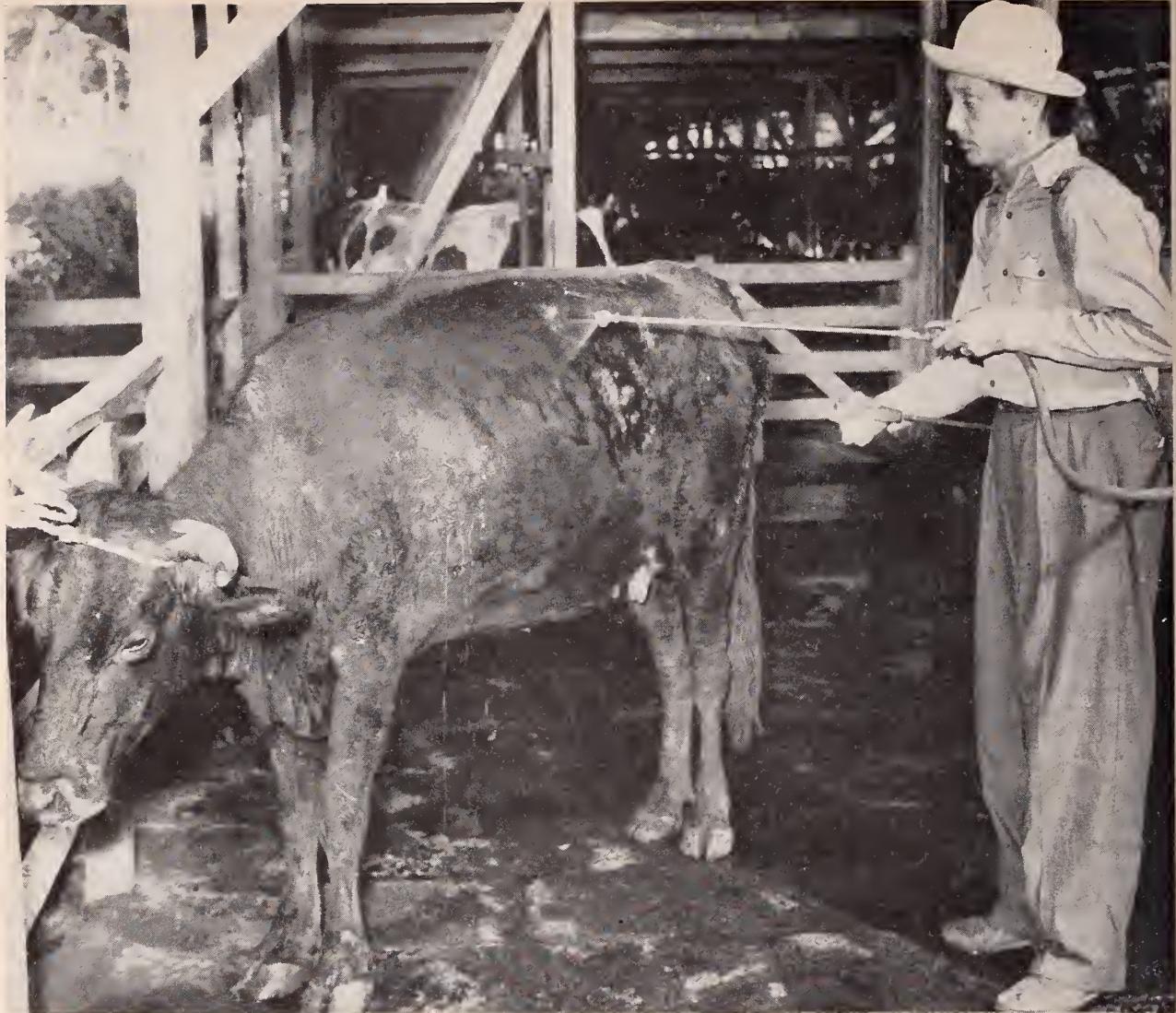
The adult torsalo does not look very important. It is a fly, shaped somewhat like the housefly, but

nearly one-half inch long. It places its eggs on mosquitoes and other flies that land on cattle—or on dogs, squirrels, rabbits, deer, and even on human beings. The eggs hatch while the host fly or mosquito is still carrying them. The young first-stage maggots crawl out and drop off on the animal's back or shoulders, or wherever the host fly happens to land. The shoulders and sides of the animal are more severely infested simply because those areas are out of the reach of the animal's tail and it is there that the host fly usually lands. The maggots are small enough to penetrate the skin of the cow. Once under the skin, they feed on blood and tissue and develop rapidly while lumps form around them, sometimes as big as a walnut. The victim, meantime, if seriously infested, becomes a lumpy creature that is little more than skin and bones. If the victim is a mature animal, it usually recovers. If not, there is a good chance that it will die.

The larvae may live under the skin for 40 to 60 days and then emerge as grub worms the size of a cigarette butt, through holes that they cut in the skin. They then drop to the ground, where they burrow into the soil, pupate, and soon complete the cycle by emerging as adult flies.

United States technicians, with their background of knowledge and experience in dealing with parasites in the United States, knew that their first job was to find the most vulnerable point at which this life cycle might be broken and then devise ways of doing it. The two individuals principally involved in this task were Virgil C. Peterson and Paul Adams. Mr. Peterson directs the activities of the Servicio Tecnico Agricola de Nicaragua, operated jointly by the United States and Nicaraguan Governments. Paul Adams, whose chief activity now is getting extension work started in Nicaragua, was formerly extension livestock specialist at Oklahoma A & M College. The first pesticide tried in Nicaragua was toxaphene, because Dr. E. W. Laake, regional consultant entomologist for the United States Department of Agriculture in Point Four countries, had made some preliminary tests with toxaphene in

Mr. Himebaugh is Regional Extension Information Consultant for the Point Four program in Latin America, with headquarters at San Salvador, El Salvador.



Torsalo-grub-infested cow is sprayed with the pesticide toxaphene on a farm near Matagalpa, Nicaragua.

Brazil for the control of torsalo. The United States technicians started with the standard technique of treating one group of cattle and maintaining a check group under similar conditions without treatment for purposes of comparison, in order to measure their results. They began their tests under ranch conditions in the Matagalpa area in March 1950. One of these tests, typical of the research done, is sufficient to tell the story.

Eight cattle were treated at 2-week intervals with a one-half of 1 percent solution of toxaphene applied in a low-pressure spray. The results did not appear encouraging at first because of the time required for the grubs under the skin to complete this stage and emerge but, at the end of 2 months,

the researchers had proof that they were preventing the development of additional grubs. The number on the treated cattle by this time was down to about half the number on the untreated group. At the end of 3 months the treated group had less than 10 percent as many grubs as the untreated group. Moreover, an important byproduct of torsalo control was becoming evident. The toxaphene spray was controlling another serious pest—ticks that feed on the blood of cattle and also transmit a disease that causes fever and illness. The combined effects of controlling, simultaneously, two parasitic enemies, by now had resulted in a remarkable contrast in health and condition of the treated animals compared with those that were untreated. At the end

of 7 months, when the tests were completed, there was an average of 114 pounds difference in weight per animal between the two groups. What had happened was important financially even at the relatively low prices of cattle in Central America compared with prices in the United States. It was estimated that the difference was at least \$15 per head, considering the difference in the weights of the animals and the difference in the value of the hides and of the calves. Protection of the cattle against torsalo can normally be expected to double the value of hides and cut calf losses in half.

Diosal Morales, of the Ministry of Agriculture, who is in charge of the new government torsalo control program, has some figures that show that the cost of control is insignificant compared with the results obtained. Experience in his work would indicate that mature cattle can be protected for a year at a cost of 30 cents each for the toxaphene.

The labor costs are in addition and vary according to the conditions under which the animals are handled. With the type of holding chute devised by the United States technicians and the recommended type of barrel or knapsack sprayer, two men can treat mature cattle at the rate of one a minute.

The Nicaraguan Ministry of Agriculture, under Enrique Fernando Sanchez, is taking full advantage of the control measures that have been developed. Seven government technicians are working their way across the country along prescribed routes with a combined educational and demonstration control program. It will take several years to cover Nicaragua in this effort, but, in the meantime, the work of these men is backed up with a national law that prohibits the movement of cattle infected with torsalo. Nicaragua is well on the way toward national control of the pest that threatened the existence of its cattle industry.



Extension agent of the Nicaraguan-United States cooperative agricultural station, with his torsalo control equipment, travels around his district regularly, spraying livestock for torsalo grubs, which have threatened Nicaragua's livestock industry.

Citronella in Ceylon

By E. T. GOONEWARDENE

Citronella (*Cymbopogon nardus*) is a giant grass that is easily and inexpensively grown in Ceylon. With little attention and practically no fertilizer, citronella yields generously rich crops. Reaching maturity within 4 months of planting, it brings in three seasonal cash returns a year. Citronella is resistant to prolonged drought and, since it is not eaten by cattle, it is an ideal intercrop on the coconut estates.

The oil of the citronella grass is a fragrant, brown-colored honey in its pure form. Because of its strong, astringent, highly diffusive odor, it is an effective insect repellent. The oil is also used in synthetic menthol and in the preparation of perfumes and soap, where it serves a dual purpose—as an oily base and as a fragrance.

Production of citronella grass has been given impetus in recent years by the unprecedented prices that it has brought, and the oil is now a major export of Ceylon. Prices—now about \$1.70 a quart—are from two to three times higher than those of prewar days. Farmers are clearing and planting to citronella grass many plots of land that had been abandoned.

The process of distilling citronella oil is a skill that is handed down from one generation to another in the rural villages of Ceylon. Those persons experienced in the art supervise the process. The regulation of temperature and of pressure, the loading of grass in the cisterns, and the time allowed for boiling, all are done with precision.

The grass to be processed is dried for a day in the sun and then carried into a shed and put into two large, round, cast-iron cisterns, which are connected by a valve. These cisterns are tightly covered by lids, held in place by iron bolts. As a further measure of conserving the heat, the lids are plastered with a paste of cow dung and mud. The cisterns are joined to a boiler, where water is heated by means of a brick-and-mud furnace, which somewhat resembles a baker's oven. The water when heated condenses into steam, which travels from the boiler, through metal pipes, to the tanks containing

the stacked leaf. The oil globules, coming into contact with the steam, are dislodged and travel, with the now rapidly cooling steam, through a tortuous coil of steel tubing. The coil is immersed in a tank of cool water. When the oil comes out of the tube into the water, it forms a film on the surface and is collected. The process of distillation is a continuous one, the steam being made to pass from one tank to the other by means of the valve.

The quantity of oil obtained varies with the quality of the grass, the season, and the skill of the distiller. Generally, however, an average yield of 4 to 5 gallons per acre can be expected each season.

Despite the ease with which citronella grass is produced in Ceylon and the efficiency of the village distilling methods, oil output could be increased substantially with the introduction of high-yielding varieties of the grass, the use of artificial fertilizers, and the adoption of modern methods and equipment in the distilling process.



Singhalese farm family of southern Ceylon harvest one of their three citronella grass crops of the year.

Mr. Goonewardene is Agronomist, Siromi, Matara, Ceylon.

Japan's Agricultural Cooperative Program

by GORDON H. WARD



Japanese farmers have made substantial headway in the past 5 years in developing independent member-controlled cooperatives. If Japanese farmers, only recently freed from the traditional influence of landlords, can operate cooperatives and federations up to national scope in size, perhaps farmers in other Asian countries can follow their lead. Lessons learned in the cooperative program in Japan are being utilized in Okinawa, Formosa, the Philippines, and Indonesia. Delegates at international conferences on cooperatives in India, Ceylon, and Pakistan have shown keen interest in reports on the history and accomplishments of cooperatives in Japan.

Since the Agricultural Cooperative Association Law went into effect in December 1947, Japanese farmers have organized more than 35,000 cooperatives and over 1,200 federations. Cooperatives report 7,950,000 farmer members and 450,000 nonfarmer associate members without a vote. Virtually every family from Japan's 6,180,000 farms is a member of one or more cooperatives. The number of cooperatives in operation continues to increase despite some business failures and consolidations. Cooperatives are the primary credit, marketing, purchasing, and processing agencies in almost every village.

Japanese farmers do about half of their marketing and purchasing through cooperatives. They have deposited about two thirds of their money in the village cooperatives, and approximately 75 percent of their borrowing from financial institutions is from cooperatives. And, in more than half of the Prefectures (states), federations of cooperatives are the principal source of hospital and medical care for farm families.

Half a Century of Cooperative Development

The growth and development of cooperatives in Japan since 1947 is not quite as remarkable as it appears at first glance. Actually the Japanese farmers' experience with cooperatives dates from 1900 when the government enacted the Industrial Coop-

erative Law. Under this law the government sponsored the organization of savings and loan associations to extend production credit to farmers. In time the cooperatives became the banks for the villages. Merchants and landlords, as well as farmers, maintained deposits in them. The government advanced postal savings funds each spring to assist in financing crop production. In the course of time the credit associations took on marketing, purchasing, and processing functions to become general-purpose service institutions for the villages.

By 1940 there were 15,101 farm cooperatives in operation with a membership exceeding 8 million. The members elected directors and voted on matters in the annual meeting, but the government appointed the president and had the right to veto decisions of the membership. Usually the village landlord was appointed president and determined who was granted loans and how much. Nonfarmers were permitted to become voting members. As a result, most cooperatives were dominated by the merchants and the village landlord. Many farmers were in feudalistic servitude to the landlord, since more than two-thirds of them rented all or part of the land they cultivated. Consequently most cooperatives provided essential services to the generally inactive members on a paternalistic basis. Government direction of the cooperative program increased with the passing of the years.

When the growing population of Japan outstripped the domestically produced food supply at the beginning of this century, the government took another step to stimulate increased farm output. Under a law enacted in 1899, every farmer had to join the local agricultural society and pay annual dues to help support its activities. The local societies were federated into 46 Prefectural societies and these in turn were members of the Imperial Agricultural Society in Tokyo. The government paid a subsidy to enable each local society to em-

Mr. Ward was in charge of the agricultural cooperative program in Japan from September 1949 through June 1951.



Japanese farm village. Cooperatives are an important part of village life in Japan; nearly every farm family is a member of at least one co-op.

ploy a farming technician to give personal instruction to individual farmers regarding new methods of increasing their yields of food crops.

During the war, the Agricultural Organization Law of 1943 merged the industrial cooperatives with the agricultural societies and made membership compulsory for every farmer. Through this integrated system composed of the National Agricultural Association, the 46 Prefectural associations, and 10,721 village, town, and city agricultural associations, the government regimented farmers to support the war program. Through these associations agricultural production and prices were controlled, food collections and rationing were accomplished, and farmers' compulsory savings were collected for financing the war.

Agrarian Reform Fostered Freedom for Farmers

A memorandum from the United States Joint Chiefs of Staff in the fall of 1945 directed the Supreme Commander for the Allied Powers to democratize Japan in order to forestall the resurgence of aggressive militarism. This memorandum required policies favoring the development of democratic organizations in labor, industry, and agri-

culture in accordance with the Potsdam Declaration, which called for strengthening the democratic tendencies of the Japanese people.

Occupation officials realized that the domination of farmers by landlords and the government control over them exercised through the agricultural associations had to be eliminated before democracy could develop in farm villages. In order to bring about this liberation the Supreme Commander directed the Japanese Government in December 1945 to submit by March 15, 1946, a program for agrarian reform. This program was to contain plans for transfer of ownership of land to cultivators and provide for "protection of former tenants against reversion to tenancy status" through, among other things, "a program to foster and encourage an agricultural cooperative movement free of domination by nonagrarian interests and dedicated to the economic and cultural advancement of the Japanese farmer."

Through extended conferences mutually acceptable legislation to accomplish agrarian reform was in time evolved.

The land reform program,¹ based on legislation

¹ See "Japan's Land Reform" by Wolf I. Ladejinsky, *Foreign Agriculture*, September 1951.

enacted in October 1946, increased the percentage of owner-operated land from 54 to 90 percent. Owner-cultivators became the predominant type of farmer in Japan. Farm people were freed to throw off their feudalistic deference to the landlord. The way was opened for former tenants to rise to positions of leadership in cooperatives and in village affairs.

The establishment of independent member-controlled cooperatives was made possible by twin laws that became effective December 15, 1947. One law abolished the government-controlled agricultural associations and established procedures for their liquidation. The second—the Agricultural Cooperative Association Law—provided for the organization and operation of cooperatives in accordance with internationally recognized cooperative principles. With the technical assistance and protection from coercion given by government officials administering the new cooperative program, farmers proceeded with the organization of such cooperatives as they considered would best serve their needs.

Development of Independent Member-Controlled Cooperatives

The Agricultural Cooperative Association Law placed the administration of the program with the Ministry of Agriculture and Forestry. It authorized delegation of local administration to the Prefec-



Many village cooperatives hull and then flake barley kernels for their members. Barley cooked with rice is a popular dish in Japan.

tural governments. The Agricultural Cooperative Association Division was established in the Ministry to administer the law nationally and the Prefectures set up Cooperative Sections. A nation-wide education and information program was commenced as soon as the cooperative law became effective. This program informed farmers of their new right to organize such cooperatives as they chose and explained the procedures for organizing and operating these business enterprises. Elections of directors and auditors were carefully supervised to insure strict adherence to the provisions of the law and to assure each neighborhood equitable representation.

Within 8 months—by August 14, 1948—22,148 cooperatives and 200 federations were in operation. There were nearly 13,300 local general-purpose cooperatives ready to take over the properties and activities of the 10,721 dissolved village, town, and city agricultural associations, which had to cease operations on that date according to law.

Functions of Cooperatives and Federations

Nearly all Japanese farmers belong to the general-purpose cooperative that serves their locality. They deposit most of their money in its credit department and borrow from this department when funds are needed for production and living expenses. They buy many of their farm and home supplies through the purchasing department. Many local cooperatives have facilities for milling rice and other grains. Farmers deliver nearly all of their staple food crops to cooperatives for sale to the government at fixed prices. Some village cooperatives handle the sale of other products, though specialized cooperatives often sell vegetables, fruit, livestock, milk, silk cocoons, or other special products for the members. Often such specialized cooperatives dispose of the products through a county or Prefectural federation. There are national federations in many of these fields that serve as liaison agencies and assist with marketing operations. The National Purchasing Federation handles more than half the fertilizer bought by Japanese farmers.

Most local cooperatives are members of the Prefectural credit federation in which they deposit surplus funds and from which they borrow operating capital and funds to loan members. The Prefectural credit federations loan money to cooperatives and federations and deposit unused funds in the Central Cooperative Bank for Agriculture and For-

stry in Tokyo. This bank makes loans primarily to national federations and Prefectural credit federations. Official standards governing financial operations provide that local cooperatives cannot use more than 20 percent of member deposits for financing business operations. Loans by cooperatives and federations are limited to 20 times the amount of capital stock of the lending organization owned by the borrower. Adherence to these standards is maintained through annual audits by government auditors. The standards also serve as a guide to sound financial condition.

The general-purpose cooperatives for the most part are also members of the Prefectural marketing, purchasing, processing, educational, and hospital and medical-care federations. They often belong to county federations for making starch from sweetpotatoes, or for marketing any special products their members produce. Most of the Prefectural federations are affiliated with the corresponding national federations.

The leaders of the local cooperatives have now established general adherence to the principle that federations are the servants of the member associations and shall function in accordance with the decisions of the membership. Former officials of the

dissolved Prefectural and national agricultural associations are having to abandon their idea of directing the cooperative structure from the top down. Freedom of local cooperatives to function independently of domination by such former leaders is safeguarded by the cooperative law. A Prefectural federation may engage in only one of three groups of functions—credit, business, or nonbusiness. This prevents formation of a powerful multi-purpose federation.

Measures to Strengthen Farmer Cooperatives

National and Prefectural governments have continued to give advice and educational assistance on the operation of cooperatives and the improvement of management, business practices, and accounting. In cooperation with the educational federations, the governments conduct member education programs and training conferences for cooperative officials and employees. Training schools for employees are operated in Tokyo and in each of the 46 Prefectures.

Continuing education and information programs have led to greater member participation in the affairs of both local cooperatives and federations.

Most cooperatives and federations have been



Japanese farm families take an active interest in their cooperatives. These men and women have gathered to listen to an analysis of the current position of their village's general-purpose cooperative.

severely handicapped by inadequate member investment. A nation-wide capital increase campaign has more than doubled the amount of paid-up capital stock during the past 2 years. Government regulations require that member investment equal the book value of the properties of cooperatives and federations by 1955. Progress to date indicates the requirement will be met unless there is an agricultural depression.

Many cooperatives and federations have suffered substantial losses because of poor business management and inefficient operating practices. It has been customary in Japan for the directors to designate one of their number as managing director to operate the business. Farmer-directors without business experience have frequently made costly mistakes. Now, however, it is a growing practice to elect a person with business experience to the board of directors and appoint him managing director under a provision of the cooperative law that permits 25 percent of the directors to be nonfarmers. A nation-wide management improvement program has fostered material progress in better management and operating efficiency.

A government-sponsored 5-year rehabilitation program offers encouragement loans to cooperative organizations with substantial deficits that undertake programs to improve their business efficiency and amortize past losses. Better management is expected to result from widespread installation of a greatly improved accounting system, which readily furnishes figures for periodic reports on operating results and financial position. This new system was developed with the assistance of an American expert in cooperative accounting and auditing.

Growing member interest and participation are reported by the government and education federations. About two-thirds of the voting members attend the annual meetings. Many take part in the discussion of reports and ask questions of officers. Substantial improvements in service and business operations have resulted. Although numerous problems are still in process of solution, many cooperatives and federations are functioning effectively and others are showing promise. Through their cooperatives, Japanese farmers are learning to use democratic processes to advance their economic and social welfare.

Some Observations on Land Tenure in Colombia

by T. LYNN SMITH



Colombia suffers acutely from great confusion in the nature and extent of the basic rights that the property owner has in the land. And there is little hope for immediate improvement, for the problems seem to become more acute with each decade.

The roots of the trouble go back many years, not a few of them to the colonial epoch. Throughout that long period large, ill-defined tracts of land were lavishly granted, no systematic land surveys were made, titles were recorded carelessly, and occasionally illegal claims to land were regularized in wholesale lots.

Fundamentally, many of the difficulties seem to stem from the attempt to express simultaneously two conflicting philosophies of the nature of property rights to land. Spanish law held that all the

land in the territories of the newly discovered countries belonged to the Crown, and that individual rights to portions of it were to be dispensed at the pleasure of the king. The usual manner of transferring rights to the land from the monarch to the private individual was by gift, although in some periods land was also sold. But at the same time, at least sporadically, the king and his lawyers gave favorable nods to the second philosophy—the proposition that the claimant must use the land or his claim to it would be nullified. Under this philosophy, provisions were made for adjusting and confirming claims of persons to lands by giving some of them valid deeds to tracts of ground they had entered upon and occupied without any semblance of authority from the king or the state.

Dr. Smith, Professor, Department of Sociology and Anthropology, University of Florida, Gainsville, is a well-known writer on the subject of land problems.



Small farmsteads of the Tabio community of Colombia.

The idea that possession and use of the land, and not merely a paper from the authorities, gave property rights to it, grew and flourished as one colonial epoch succeeded another. It also continued to wax in importance in the disturbed period of revolution and during the disordered times accompanying the frequent civil wars that plagued the Republic during the nineteenth century, the first century of its existence. The discordant state of affairs reached unprecedented heights during the great economic depression of the 1930's.

It is not possible to give all the details concerning the explosive situation that had arisen by the 1930's, the time the Liberal regime gained control of the government, but here are some of the significant features in the tremendous struggle for the land.

In some sections of the country the peasants had long continued to pay, without serious protest, the tribute or rent demanded by the handful of people who had possessed themselves of legal or other titles to huge expanses of the national territory. If we

may believe some of the travelers' accounts, the most idyllic relationships prevailed between the landowners and the peasants who extracted a humble living by working small pieces of the huge estates. For example, Richard Bache gives this picture of the rural scene on the Acosta barony at Guaduas, a famous stopping place on the trail from Bogotá to the Magdalena River:

April 8th (1823). Left Villetá at 9, A.M. arrived at Guaduas—four leagues, at 1, P.M. Parts of the road very steep—enjoyed some fine views.

We presented letters from our friends in Bogotá to Colonel Acosta, who entertained us very hospitably. This gentleman is the Juez-político of the village of Guaduas, and proprietor of thirty leagues square of mountainous, but fruitful land. He is a well-informed, agreeable man, of patriarchal simplicity of manners. In one end of his large house, he keeps a store, containing some foreign fabrics, and the little manufacture of his tenants; principally consisting of straw hats, which are manufactured in almost every house of the village, sandals, baskets, and wooden vessels. He attends to this little shop himself. While sitting with him here, I had an opportunity of witnessing the kind interest he took, as a magistrate and landlord, in the affairs of his clients and tenants; as well as their respectful, yet confiding bearing in his presence. These

tenants pay from six to eight, and ten dollars per annum, for as much land as they choose to cultivate. We saw some of them, who came to barter with their patron, dispose of their manufactures, obtain a small loan, ask alms or advice. They were all kindly received, listened to with patience, and dismissed contented.¹

But other large proprietors were early plagued with the "problem of colonos." Thus wrote J. Stewart in 1838:

... Mr. Haldane had previously many tenants on his lands, whom he allowed to erect houses, and cultivate for their own use a certain portion, provided they, in return, cleared a fixed quantity of land for the owner (but, since the affray here related, Mr. Haldane has broken up all these settlements); and that the people, instead of confining their cattle within proper limits, allowed hogs, etc., to run wild, to the great damage of the different crops; upon which Mr. Haldane, having in vain remonstrated with them from time to time, at last told them that, unless the practice was given up forthwith, he would shoot the first hog he saw at large, which he did. This act drew down their vengeance upon him, and first led to the infamous conspiracy, the intention of which was the murder of the whole family, and then the plundering of the house. ...²

Law 200, Chapter I

The most revolutionary feature of Law 200 is the provision that states that the only valid claim to land is the economic utilization of the land. In literal translation, the legal phrasing of this basic proposition is contained in the following extracts:

Article 1. Presumed not to be public lands, but private property, are the tracts occupied by private persons, it being understood that said possession consists of the economic exploitation of the soil by means of positive actions on the part of the owner, such as planting or seeding, occupation with livestock, and others of equal economic significance.

Inclosure with fences and the erection of buildings do not of themselves constitute proof of economic utilization, but they may be considered as elements complementary to it.

The presumption which this article establishes extends also to the unused parts whose existence is necessary for the economic utilization of the property, or as complementary for the best use of the same, even though the territories involved are not contiguous, or for the enlargement of the enterprise. Together these portions may be of an extension equal to the part utilized and which are reputed to be possessed in accordance with this article.

Article 2. Rural tracts not possessed in the manner specified in the preceding article are presumed to be public lands.

Article 3. In addition to the original title conferred by the State which has not lost its legal efficacy, private property over the respective territorial extension is substantiated, and consequently the presumption stated in the preceding article is invalidated, by written titles recorded prior to the date of the present law, in which are demonstrated acts of possession for the lapse of a period not less than the limit set forth in the laws governing extraordinary prescriptions.

Article 4. The dispositions of article 3 shall not be prejudicial to persons who two years prior to the promulgation of this law may have established themselves, without recognition of any dominion other than that of the State, and not by precarious title, on lands that were unused at the time of occupation.

In this case, the proof of private property in the respective plot of land may be established only in one of these ways:

(a) By the presentation of the original title, emanating from the State which has not lost its legal efficacy;

(b) By any other proof, also in full,

In other parts of the Republic, particularly in Caldas, the peasants were making fundamental progress in shaking off the bonds of custom that

¹ *Notes on Columbia*, p. 245, Philadelphia: H. C. Carey & I. Lea, 1827.

² *Bogotá in 1836-7*, p. 243, New York: Harper & Brothers, 1838. It would seem that eventually Mr. Haldane succeeded in coming to terms with the peasants of the region, for in a later volume is found the following comments upon his estate: "At Palmar, not very far from Guaduas, the estimable Robert Haldane, Esq., has been usefully occupied many years on a vast estate of his own, originally 'tierras baldías.' This gentleman has proved by actual results what a Protestant Christian can do in these wonderfully fertile regions. I met with him a short time many years ago, at the hospitable table of our mutual friend Colonel Acosta, when he told me something of his agricultural plans. Now, he has on his estate no less than 180 families of natives all paying him rent, and his population numbers 700 souls, to whom he ministers usefully, persevering in instructing them not only in arts of industry and civilization but better still, in Protestant Christianity." William Leay, *New Granada, Equatorial South America*, London: Christian Book Society, 1869, p. 102.

that the plot has legitimately left the patrimony of the State; and

(c) By the presentation of a title transferring dominion dated prior to October 11, 1821.

Article 5. The dispositions of the present law pertain exclusively to property rights to the surface of the territory, and have no application whatsoever, with respect to the subsoil.

Article 6. There is established in favor of the Nation the extinction of the right of dominion or property to rural tracts on which possession is not exercised in the form established by article 1 of this law during the lapse of ten continuous years.

When possession has been exercised over a part of the area only, the extinction of dominion shall pertain only to the unused portions which are not reputed to be possessed in conformity with this Law.

The extinction of property rights shall have no effect in relation to the following tracts:

1. One that has a total area of less than three hundred (300) hectares which constitutes the only rural property of the respective owner, and

2. Those belonging to persons absolutely incapacitated or to the adult minors, when they have been acquired through inheritance, and while the incapacitation shall last.

obliged them to pay for the use of a modest tract of ground, when other land of equal quality was theirs for the taking.

There has been little systematic study of the precise dates at which the peasants in the various parts of Colombia began to sense that the laws gave them a right to take possession of land in the public domain, cultivate it, and eventually have small tracts adjudicated to them as private property. It came early in Antioquia and Caldas, late in many other parts of the nation; but as early as 1930 it seems to have become rather common knowledge among the rural folk, who are responsible for the production of most of the nation's food crops. But in 1930 there was no way of telling which unused lands were claimed as private property and which were actually a part of the public domain. It would seem that the large landholders were opposed to the surveying of lines of demarcation, for this was one of the measures instituted by the Liberal Government, when it came into power, that met with great opposition. Without land surveys the peasant had difficulty in making sure that he was not on private property, and the government officials were handicapped in trying to direct colonists to unoccupied public lands. According to Francisco José Chaux, the Senator who prepared the exposition of motives for the project that eventually became the fundamental land law, Law 200, in his address to the upper house of Congress on August 30, 1933, "in many regions of the country, and especially in Cundinamarca, Tolima, Boyacá, and Magdalena, the confusion in land titles has made possible great latifundia, inhabited by a mass of workers subject to the despotism of an economy of minimum production, immediately consumable." They lack capital and for want of "property rights to the soil which sustains them, never succeed in securing a home for their families, and in place of being factors for the creation of riches, are foci of social unrest. If for a long time these masses have remained tranquil, submitted usually to an ignominious regime of labor, condemned to eternal indigency, their own increase and the awakening of the collective conscience has torn from them that submission and has inspired them to make an urgent and impassioned demand for land."

But the colonial origin of many of the titles, the indefinite boundaries, the lack of care in keeping the records, and the failure of previous administrations to begin the work of marking the bounda-

ries between the public domain and the adjacent estates are circumstances the joint effects of which had impeded the state from directing the colonists to unoccupied public lands.

Under these circumstances it was inevitable that the rural masses would crowd in upon any unoccupied sections. And it was equally inevitable that much ill will, conflict, and violence would result. One of the main sources of acute disorders was the fact that some of the proprietors would allow the squatters to remain for years, until the land had been cleared and adapted to cultivation, and then armed with titles and in command of the local police they would appear on the scene and evict the families. At times the colonos may even have been deceived into entering on private property.

It is little wonder that Colombians should commonly refer to the invasion of the haciendas by squatters as the *Problema Social Número 1*. However, the peasants have risen by slow degrees. Some groups of them have developed considerable confidence. Perhaps the factors mentioned above were supplemented by a relaxation of repressive measures, as Colombia's elite came more into contact with other western nations. Perhaps the basic causes were different. In any case, however, the rural masses adopted the practice of occupying any idle and unused lands that came to their attention. This practice of squatting developed into epidemic proportions during the great economic depression, and it has continued to wax in importance ever since. From the Zona Bananera on the north, where the invasions of the developed banana lands of the foreign fruit companies have paralyzed operations, to Narino on the south, the headline *Problema Social* in the newspaper is certain to be followed by a story of some hacienda that is in serious difficulties because the peasants have seized the land.

In 1926 and 1934, the Supreme Court of Colombia handed down decisions of great significance to the country's landholders. These decisions held that the title to land should be voided and the property revert to the state if the owner could not produce the original deed to the estate. This was like stirring up a nest of hornets and it would seem that the next move, the adoption of Law 200 on November 30, 1936, was greatly stimulated by the uproar created by the Court's decision.

Law 200 was a serious, conscientious effort to deal with this problem of squatters. It recognized the basic injustice of permitting the latifundistas

to retain the right generation after generation to broad acreages that were deliberately withheld from productive uses, while hundreds of thousands of country folk lacked the right to use even the acre or two of land necessary to enable them to provide for the meager felt needs of their families.

Such a state of affairs was in basic disagreement with the fundamental Spanish law that Colombia, along with the other New World republics, has inherited. It was also greatly in conflict with the ideals and aspirations of many of Colombia's young intellectuals.

The provisions of Law 200 were generally interpreted as meaning that the landowner had a 10-year period of grace in which to demonstrate that he was making economic use of the lands claimed. It was thought to be the equivalent of telling the absentee owner or the other claimant to large unused tracts: "You claim that you own this 10,000 hectares. All right, you have 10 years in which to put it to use. If at the end of that time you have developed 4,000 hectares of it into arable lands or pastures, you may keep that 4,000 and an additional 4,000; the government will take back the remain-

der." Since the 10 years did not elapse until November 30, 1946, great uncertainty as to the true state of affairs, and what was in the offing, prevailed all during the Second World War and the years immediately preceding it. Nor has the confusion been dispelled since the end of the war, for since then intermittent civil war has plagued the country, now and then flaring up in extreme violence such as that which disrupted the Inter-American Conference at Bogotá in April 1948, and that several months earlier which resulted in the leveling of dozens of Liberal pueblos in Norte de Santander, the killing of hundreds of people, and the flight of tens of thousands to a haven of refuge across the international boundary in Venezuela. Amid such chaotic political conditions, when the personal safety of the majority of the population is seriously endangered, obviously there is little chance for any real progress in the classification of the basic nature of property rights in land. The confusion continues, and the chaos becomes greater day by day. One can confidently assert that the uncertainties about property rights in the land will continue to plague Colombia and the Colombians for years to come.



Harvesting corn in an Andean valley north of Bogotá, Colombia.

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